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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/871,029 06/09/97 PRATER

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EXAMINER

MM91/0430

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LARKIN, D ART UNIT	PAPER NUMBER
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2856
DATE MAILED:

04/30/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/871,029

Applicant(s)

PRATER et al.

Examiner

Daniel Larkin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9 Jun 1997.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42-77 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42-48, 50, 56-58, 60-71, and 73-77 is/are rejected.
- 7) ☒ Claim(s) 49, 51-55, 59, and 72 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9 Jun 1997 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other: _____

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1. The preliminary amendment filed 09 June 1997 as been entered and the following action is provided based on the corrections made to the application.

2. The drawings are objected to because they do not include certain reference signs mentioned in the description. 37 CFR § 1.84(p) states, "Reference signs not mentioned in the description shall not appear in the drawing and vice versa." The following reference signs are not included in the drawings:

No figure is currently labeled **4A** as disclosed on page 14, line 24 and page 16, lines 6 and 24.

The asymmetric cutout "42b" does not appear in Figure 4B as disclosed on page 17, line 22. Correction is required.

3. Applicants are required to submit a proposed drawing correction in response to this Office Action. Any proposal by the Applicants for amendment of the drawings to cure defects must consist of two parts:

- a) A *separate* letter to the Draftsman in accordance with MPEP § 608.02(r); and
- b) A print or pen-and-ink sketch showing changes in *red ink* in accordance with MPEP § 608.02(v).

IMPORTANT NOTE: The filing of new formal drawings to correct the noted defect may be deferred until the application is allowed by the examiner, but the print or pen-and-ink sketch with proposed corrections shown in red ink is required in response to this Office Action, and *may not be deferred*.

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4. The disclosure is objected to because of the following informalities:

Page 15, lines 4 and 7: The reference to Figure "4" should be corrected to read -- 4A --.

Page 16, line 7: The reference to Figure "4" should be corrected to read -- 4A --.

Page 20, line 8: The reference to Figure "4" should be corrected to read -- 4A --.

✓ Page 32, line 4: The reference to Figure "4" should be corrected to read -- 4A --.

Appropriate correction is required.

5. Claims 43, 44, and 48-73 are objected to because of the following informalities:

✓ Re claim 43, line 1: The article "The" should be replaced with -- An -- in order to maintain consistency with the other claim introductions.

✓ Re claim 48, line 2: A -- comma -- should be inserted after the word "cantilever".

✓ Re claim 50, section c, line 4: The word "counters" should be corrected to read -- contours --.

Re claim 51, section e, line 4: The word -- lever -- has been misspelled.

✓ Re claim 56, section b, line 2: The second occurrence of the word -- lever -- has been misspelled.

✓ Re claim 66, line 3: The word -- tip -- should be inserted after the word "sensing".

Appropriate correction is required.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 42-48, 50, 56-58, 60-71, and 73-77 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over "Novel Stationary-Sample Atomic Force Microscope With Beam-Tracking Lens" (Jung et al.).

With respect to the limitations of claims 42, 48, 56, 66, and 74, the article to Jung et al. discloses an atomic force microscope comprising a scanning mechanism/beam steering device/motion control device (P) for moving both a cantilever (CT) and an optical assembly/beam steering lens (L), a light source (LS), and a position detector (PSD) which is not moved by the scanning mechanism (P) which receives light reflected from the surface of the cantilever.

With respect to the limitation of claim 43, the article to Jung et al. shows that light reflected from the cantilever (CT) to the position detector (PSD) does not pass through the steering lens (L).

With respect to the limitation of claim 44, the Examiner argues that this limitation is inherent in view of the teachings of Jung et al. in that the position of the light detector might be so positioned as to receive deflection motion of the cantilever regardless of where the scanning takes place because the position detector does not move during the scanning movement of the cantilever, so the position detector must have a large area of detection in order to ensure that all deflection motion during scanning is detected.

With respect to the limitation of claim 45, the cantilever (CT) is provided with a tip at the free end of the cantilever.

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With respect to the limitation of claim 46, the scanning mechanism (P) is comprised of a piezoceramic tube (PZT).

With respect to the limitation of claim 47, the Examiner argues that the positioning of the beam steering lens within the piezoelectric tube utilized by Applicants is obvious in view of the means for positioning the beam utilized by Jung et al. because the placement of the lens as shown in Jung et al. would achieve an equivalent scanning measurement result to the placement of the steering lens shown in Applicants' invention. The courts have held that shifting the location of a part without modifying the operation of the device is not inventive. In re Japikse, 86 USPQ 70 (CCPA 1950). Additionally, the Applicants have recited that the optical assembly may be mounted in the scanner, page 12, lines 7-9. The use of term "may" would suggest that the microscope would work equally as well if the optical assembly were mounted outside the tube.

With respect to the limitations of claim 50, the article to Jung et al. discloses a sensing probe/cantilever (CT), illuminating means/light source (LS) which applies a light source to the back of the cantilever (CT), position control means/scanning mechanism (P) for scanning the tip parallel to the sample surface, and detector means/detector (PSD). The beam positioning means/steering lens (L) utilized by Applicants is viewed as being obvious in view of the means for positioning the beam utilized by Jung et al. because the placement of the lens as shown in Jung et al. would achieve an equivalent scanning measurement result to the placement of the steering lens shown in Applicants' invention. The courts have held that shifting the location of a part without modifying the operation of the device is not inventive. In re Japikse, 86 USPQ 70 (CCPA 1950).

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Additionally, the Applicants have recited that the optical assembly may be mounted in the scanner, page 12, lines 7-9. The use of term “may” would suggest that the microscope would work equally as well if the optical assembly were mounted outside the tube.

With respect to the limitation of claims 57 and 67, the light source utilized by Jung et al. is a laser diode module which provides a collimated light to the back surface of the cantilever.

With respect to the limitation of claim 58, the article to Jung et al. discloses that the light beam steering device is comprised of a lens (L) located between the light source and the reflective surface of the cantilever. The lens is coupled to the free end of the beam steering device/scanning mechanism (P).

With respect to the limitation of claim 60, the article to Jung et al. discloses that the motion control device/scanning mechanism (P) is comprised of a piezoceramic tube (PZT) which provides relative motion between the tip and the sample surface.

With respect to the limitation of claims 61 and 68, the article to Jung et al. discloses that the position detector (PSD) is comprised of a bi-cell photodetector.

With respect to the limitation of claims 62, 69, and 75, the article to Jung does not expressly state whether the microscope is operated in contact or non-contact mode. The Examiner argues that operation of a force microscopy in contact mode is well known in the art and would therefore be obvious to one of ordinary skill in the art when utilizing soft samples or conductive samples.

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With respect to the limitations of claims 63, 64, 70, and 71, the article to Jung et al. fails to expressly state the type of feedback mechanism utilized; however, the Examiner takes the position that utilizing an error signal to generate a topographical display of the sample surface would be obvious to one of ordinary skill in the art. Generating an error signal to route through feedback conditioners to create a correction signal which is then displayed as the topographical data is well known in the art.

With respect to the limitation of claim 65, the article to Jung et al. shows that the lens (L) is integrally connected to the scanning mechanism (P).

With respect to the limitation of claim 73, the article to Jung et al. shows that the lens (L) is fixed to the frame of reference of the free end of the scanning mechanism (P).

With respect to the limitation of claims 76 and 77, the article to Jung et al. fails to expressly state the type of feedback mechanism utilized; however, the Examiner takes the position that processing a deflection signal to generate a control signal for a translation device would be obvious to one of ordinary skill in the art. Generating a control signal for the purposes of controlling the scanning motion of the cantilever with respect to the sample surface requires a feedback loop because of the minute distances involved. Additionally, these control signals are often used in the prior art to generate a topographical display of the sample surface.

NOTE: Prior art was not relied upon to reject claims 49, 51-55, 59, and 72 because the prior art fails to teach and/or make obvious the following limitations:

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Claim 49: Providing a method of operating an atomic force microscope comprising splitting light from a light source into a first beam which passes through a steering lens and strikes a cantilever, and into a second beam which is directed to a second position detector in combination with the remaining limitations of the base claim.

Claims 51-55: Providing a scanning force microscope comprising focussing means for applying a light beam to the reflective surface of a sensing lever, control means for moving the sensing lever laterally with respect to the sample surface including beam directing means for causing the light beam to follow the lateral motion of the sensing lever, and driving means for moving the sensing lever in a vertical direction towards and away from the sample surface in combination with the remaining limitations of the claim.

Claims 59 and 72: Providing a scanning force microscope comprising including a mirror interposed between a light beam source and a reflective surface of a cantilever wherein the mirror is coupled to the free end of a beam steering device in combination with the remaining limitations of the base claim.

8. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

The reference to US 5,172,002 (Marshall) discloses a scanning probe microscope which may operate in contact mode and provides feedback servo circuits which provide correction signals for properly positioning the cantilever tip with respect to the sample surface.

9. Claims 51-55 are objected to, but would be allowable if corrected in accordance with the

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Examiner's suggestions recited above in paragraph 4.

10. Claims 49, 59, and 72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Daniel Larkin whose telephone number is (703) 308-6724. The Examiner can normally be reached on Monday-Friday from 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Hezron E. Williams, can be reached on (703) 305-4705. The FAX telephone number for this Technology Center (TC 2800, unit 2856) is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Daniel Larkin

26 April 2001


DANIEL S. LARKIN
PRIMARY EXAMINER


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